REMARKS

Favorable reconsideration of this application is respectfully requested in view of the following remarks.

Claim 1, the only independent claim, is rejected as being unpatentable over U.S. Patent No. 5,355,144, hereinafter Walton, in view of U.S. Patent No. 6,239,757, hereinafter Ishikawa.

Claim 1 recites an antenna pane including at least one glass pane and at least one electrically conductive coating which is subdivided by barrier lines into a number of electrically isolated segments. On the antenna pane, the coating incorporates at least one strip-like segmented surface portion in which the distance between the barrier lines is so small that the coating there can transmit HF radiation in a specified frequency range. Also, the segmented surface portion is, by contacting in contact areas at its two longitudinal sides and by its outer dimensions, constructed as a slot antenna for electromagnetic radiation in the range of frequencies which the segmented surface portion can transmit.

Walton's Fig. 10 embodiment relied upon by the Official Action is an antenna formed by a metal film layer 105 on a window 100, where a circular gap 104 in the metal film layer 105 divides the metal film layer 105 into an interior conductive polygonal panel 106 and a surrounding exterior conductive sheet 108. As illustrated in Fig. 10, the transmission line connects to a connection point on the interior conductive polygonal panel 106, and to a connection point on the surrounding exterior conductive sheet 108. The connection points are on opposite sides of a particular circumferential location of the circular gap 104.

The Official Action takes the position that Walton's metal film layer 105 constitutes a coating, and correctly notes that Walton does not disclose a coating subdivided by barrier lines into a number of electrically isolated segments on which the coating incorporates at least one strip-like segmented surface portion in which the distance between the barrier lines is so small that the coating there can transmit HF radiation in a specified frequency range, wherein the segmented surface portion is constructed as a slot antenna for electromagnetic radiation in the range of frequencies which the segmented surface portion can emit. The Official Action goes on to take the position that Ishikawa cures the above-noted deficiencies in Walton. Applicants disagree.

Ishikawa discloses a communication module which employs millimeter waves and can be used as a radar or to communicate with other, similar communication modules. Ishikawa's module includes a plurality of nonradiative waveguide elements inserted between a conductive base plate 5 and a conductive plate 6, as discussed in lines 6-11 of column 3. A millimeter wave propagates through the nonradiative waveguide elements until it diverges two ways via a directional coupler 25 to a dielectric stripline 30a and a dielectric stripline 30b. It is apparent from Ishikawa's disclosure that the directional coupler 25 introduces a 90° phase shift between the millimeter wave propagated to the dielectric stripline 30a and the millimeter wave propagated to the dielectric stripline 30b.

As illustrated in Fig. 2, the dielectric striplines 30a and 30b are arranged as if at adjacent sides of a square. As discussed in lines 58-67 of column 3, steps S1 and S2 in the conductive base plate 5 cause the millimeter waves propagated by the dielectric striplines 30a and 30b to leak and radiate. As further discussed in lines 42-

56, the radiated millimeter waves of the dielectric striplines 30a and 30b are deflected by respective dielectric prisms 34a and 34b in a perpendicular direction toward a "slot antenna" 33 in the conductive plate 6.

The formation of the "slot antenna" 33 is discussed in lines 13-22 of column 4, The "slot antenna" 33 is apparently formed by sticking conductive pieces 6a (which have been separated from the conductive plate 6) on a film and then attaching the film to the resultant opening in the conductive plate 6 to create an arrangement of latticed slots 32. As further discussed in lines 43-56 of column 4, this "slot antenna" 33 creates, from the millimeter waves having a 90° phase difference which radiate from the respective dielectric striplines 30a and 30b and are then deflected by the respective dielectric prisms 34a and 34b, a circularly polarized wave.

The Official Action states regarding the proposed combination of Walton and Ishikawa that

> [i[t would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted one known slot antenna with another since both are simply antenna capable of electromagnetic radiation and the substitution would have yielded predictable results to one of ordinary skill in the art at the time the invention was made.

The "Claim Rejections - 35 USC § 103" section of the Official Action fails to provide any specifics regarding what this proposed combination entails. However, the "Response to Arguments" section in the middle of page five of the Official Action states

> [i]f one of ordinary skill in the art were to replace the lattice slot antenna 33 of *Ishikawa* with the conductive polygonal panel 106 of *Walton*, the slot surrounding the perimeter of the element will still be present, therefore, there would still be a slot width sufficiently large enough so as to not short out the signal.

The specifics of the Official Action's position therefore appears to be that it would have been obvious to have replaced Walton's interior conductive polygonal

panel 106 of the metal film layer 105 with conductive pieces which are attached to a film and then mounted to Walton's window 100. If Applicants are mistaken as to the Official Action's position regarding the proposed combination of Walton and Ishikawa, it is respectfully requested that this position be clarified in the next Patent Office Communication.

Regarding the Official Action's position here, it is entirely unclear what would result in modifying the interior conductive polygonal panel 106 of Walton's antenna as proposed. Specifically, the connection points of Walton's transmission line are both along the same edge of the interior conductive polygonal panel 106, as illustrated in Fig. 10 of Walton. In Ishikawa, the dielectric striplines 30a and 30b (which the Examiner apparently deems to correspond to Ishikawa's transmission line connection points) are along two different edges of the "slot antenna" 33. The proposed modification would have resulted in "connection points" having a completely different spatial relationship relative to the "slot antenna" 33 than in Ishikawa's device. However, it is clear from Ishikawa that the spatial relationship is vital for the proper functioning of the device. Specifically, the slots in the "slot antenna" 33 are vertically spaced relative to one of the striplines so as to transmit waves with a vertical polarization, and are horizontally spaced relative to the other of the striplines so as to transmit waves with a horizontal polarization, the combined waves being a circularly polarized wave due to the 90° phase shift relative to the waves radiating from the two striplines. In the proposed modification, this spatial relationship would be destroyed.

Moreover, as discussed above, Ishikawa's "slot antenna" acts to polarize millimeter waves that have already radiated from the dielectric striplines 30a and

30b. In Walton, AM or FM radio waves radiate from the surface that the Official Action proposes to modify to be Ishikiawa's "slot antenna". In Walton, there are no horizontally and vertically polarized, phase shifted, radiated waves to subsequently circularly polarize. An ordinarily skilled artisan would have seen no reason to modify Walton's radiating surface to be similar to Ishikawa's polarizing lattice. The two elements simply have completely different, completely incompatible respective functions.

Furthermore, Walton makes reference in lines 36-37 of column 1 to "a conventional slot antenna" being illustrated in U.S. Patent No 4,707,700. The conventional slot antenna in the '700 patent has a length that is substantially one wavelength in the commercial FM broadcast band (87.5MHz to 108MHz, or a wavelength of about 3m), as discussed in lines 52-53 of column 1 and lines 9-12 of column 3 of the '700 patent. In Walton, the width of the slot antenna is about an inch, "with no significant improvement for a slot width greater than one inch", as discussed in lines 48-55 of column 4 of Walton. In such a conventional slot antenna, the slot is strip-like, being much longer than it is wide. Moreover, it is known to persons in the art that a slot antenna is analogous to a conventional dipole antenna (i.e. a rod). For the slot to function as a slot antenna, the slot must be appropriately dimensioned (as discussed in Walton). Additionally, an ordinarily skilled artisan would have known that in order to function as a slot antenna, the optimum slot length of the slot antenna would be $\lambda/2$, where λ is the wavelength being received (or transmitted).

In Ishikawa, the element called a "slot antenna" has a square shape. This is not the above-discussed geometry of a conventional slot antenna, which is much

longer than it is wide. In addition, the "slot antenna" of Ishikawa is for use with millimeter waves, and not for the AM or FM radio waves with which Walton is concerned. As such, an ordinarily skilled artisan would have had no reasonable expectation of success when using an antenna for the reception of one type of signal in place of an antenna designed for another type of signal. While both deal with electromagnetic radiation, the results of using the antenna of Ishikawa in Walton would, again, not have been predictable. For example, a satellite dish is used to receive television signals that are broadcast to earth via a satellite, but an entirely different type of antenna is used for the reception of terrestrial broadcast television. The two are not interchangeable.

In addition, in Ishikawa, the "slot antenna" 33 is no more a radiator of the millimeter waves than is the identification plate. For example, line 9 of column 2 of Ishikawa states that the millimeter wave is emitted from the plane antenna section and passes through the identification plate. Without the "slot antenna" 33, millimeter waves would still be emitted, but the emergent beam would not be circularly polarized.

For the above reasons, Claim 1 is therefore allowable over Walton in view of Ishikawa, and withdrawal of the rejection of Claim 1 is respectfully requested.

The dependent claims are allowable at least by virtue of their dependence from allowable independent claims. Thus, a detailed discussion of the additional distinguishing features recited in the dependent claims is not set forth at this time.

Early and favorable action with respect to this application is respectfully requested.

Should any questions arise in connection with this application or should the Examiner believe that a telephone conference with the undersigned would be helpful in resolving any remaining issues pertaining to this application the undersigned respectfully requests that he be contacted at the number indicated below.

Respectfully submitted,

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